LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A ~~type of~~ particulate reinforced aluminum-based composite which comprises reinforced particles and aluminum alloy, wherein:

(1) the reinforced particles are dispersively and uniformly distributed in an aluminum alloy matrix, and forms interfacial bonding with the matrix;

(2) the average particle size of the reinforced particles is 0.1 ~3.5μm; ~~and~~

(3) the volume percentage of the reinforced particles is 10 ~ 40%<u>; and</u>

(4) <u>the reinforced particles are selected from the group consisting of B_4C, Al_2O_3 and AlN</u>.

2. (Canceled)

3. (Currently Amended) A ~~type of~~ particulate reinforced aluminum-based composite as claimed in claim 1, wherein the aluminum alloy is selected from the group consisting of forged aluminum, duralumin and super duralumin.

4. (Currently Amended) A ~~type of~~ particulate reinforced aluminum-based composite component, wherein the component is made from a billet of the particulate reinforced aluminum-based composite as claimed in claim 1.

5. (Currently Amended) A method of forming a ~~type of~~ particulate reinforced aluminum-based composite component comprising the steps of:

(1) according to a desired volume percentage of reinforced particles in an aluminum-based composite, determining a weight percentage of the required reinforced particles;

(2) based on the required weight percentage of reinforced particles in the composite, determining a required weight of the reinforced particle and corresponding weight of an aluminum alloy powder;

(3) loading required amounts of reinforced particles, Al-based alloy powder and steel balls into a balling drum of a high-energy ball-mill, then carrying out high-energy ball-milling to form a composite powder;

(4) adding liquid surfactant, and continuing with ball-milling;

(5) molding the composite powder into a desired shape through cold isostatic pressing;

(6) processing the cold isostatic pressed shape into a compact billet by means of vacuum sintering or vacuum hot-pressing; then

(7) heating the compact billet, and undertaking semisolid die-cast forming to produce a near net shape composite component.

6. (Original) A method as claimed in claim 5, wherein the volume percentage of reinforced particles is 10~40% and the weight percentage of reinforced particles is 9.3 ~50.9%.

7. (Original) A method as claimed in claim 5, wherein high-energy ball-milling is performed for 1 ~10 hours and a ball power weight ratio is 10-50:1.

8. (Original) A method as claimed in claim 5, where the high-energy ball-milling is divided into a low speed stage wherein a rotational speed is 100 ~ 150rpm for 10 ~40 minutes, and a high speed stage wherein a rotational speed is 150 ~300rpm for 20 ~600 minutes.

9. (Original) A method as claimed in claim 5, wherein after adding liquid surfactant, ball-milling is continued for 0.5~2 hours within a temperature range of 15~80°C.

10. (Original) A method as claimed in claim 5, wherein the compact billet has a density of 70~80% of its theoretical density, and is formed by applying a pressure of 20~1000 Mpa for 1~10 minutes.

11. (Original) A method as claimed in claim 5, wherein the vacuum sintering or vacuum hot-pressing is carried out at a temperature of 450~600°C, pressure of 36~700Mpa and vacuum degree of not less than 1.5×10^{-2} Pa.

12. (Original) A method as claimed in claim 5, wherein the compact billet is heated to 600~660°C to reach a 60~70% liquid phase content.

13. (Original) A method as claimed in claim 5, wherein the reinforced particle is selected from the group consisting of B_4C, SiC, Al_2O_3 and AlN.

14. (Original) A method as claimed in claim 5, wherein the aluminum alloy is selected from the group consisting of forged aluminum, duralumin and super duralumin.

15. (Original) A method as claimed in claim 5, wherein the average size ratio between the said reinforced particle and the Al-base alloy powder can be selected randomly within a range of 0.1 ~100μm/10~210μm.

16. (Original) A method as claimed in claim 5, wherein the steel balls are high-carbon steel balls of φ5~φ8mm.

17. (Original) A method as claimed in claim 5, wherein the balling drum is first vacuumized to a vacuum degree of 0.1~10Pa, then an inert gas of nitrogen or argon is added at a pressure of 1.01×10^5Pa, and the balling drum undertakes high-energy ball-milling with cooling of 5~25°C.

18. (Original) A method as claimed in claim 5, wherein the amount of the added surfactant is 10 - 50ml.

19. (Original) A method as claimed is claim 18, wherein during the ball-milling process, the balling drum is first vacuumized to a vacuum degree of 0.1 ~ 10Pa, then an inert gas of nitrogen or argon is added at a pressure of 1.01×10^5Pa ~ 1.1×10^5Pa, and the balling drum undertakes high-energy ball-milling without cooling.

20. (Original) A method as claimed in claim 5, wherein the particle size range of the composite powder after the high-energy ball-milling is 10-120μm.

21. (Original) A method as claimed in claim 5, wherein the added surfactant is an organic solvent selected from the group consisting of gasoline, aviation gasoline, methanol and ethanol.

22. (Original) A method as claimed in claim 5, wherein the compact billet is shaped by means of semisolid die-casting after it is heated.